LISTING OF THE CLAIMS

The following replaces all prior versions and listing of claims in the application:

1. (Previously Presented) A method for controlling intake air of an internal combustion engine, the engine having at least one combustion chamber provided with an intake valve together with an intake manifold provided with a throttle valve, wherein the opening and closure timings of the intake valve are adjustable independently from a crankshaft position to control the amount of intake air supplied to the combustion chamber, the method comprising:

damping an operating signal for the intake valve relative to a change in acceleration or deceleration demand on the engine, for unthrottled intake air control.

2. (Previously Presented) The method as claimed in claim 3, wherein the step of providing the response adjustment comprises:

providing an engine response performance during unthrottled intake air control as much as an engine response performance during throttled intake air control.

3. (Previously Presented) A method for controlling intake air of an internal combustion engine, the engine having at least one combustion chamber provided with intake means together with an intake manifold provided with a throttle valve, wherein the opening and closure timings of the intake means are adjustable entirely independently from the crankshaft position to control the amount of intake air supplied to the combustion chamber, the method comprising:

providing a response adjustment to variable valve timing control of the intake means for unthrottled intake air control;

separating a first operation range for unthrottled intake air control from a second operation range for throttled intake air control;

varying valve timing of the intake means with the throttle valve held in the neighborhood of the wide open throttle position to perform throttled intake air control during said first operation range; and varying throttle valve position of the throttle valve with valve timing of the intake means held to provide a valve opening duration in the neighborhood of the minimum valve opening duration.

4. (Previously Presented) The method as claimed in claim 3, further comprising:

determining a first operation variable indicative of a target intake air;

determining a second operation variable indicative of a target valve timing based on the first operation variable;

wherein the step of providing the response adjustment comprises:

processing the second operation variable to cause the response adjustment.

5. (Previously Presented) A system for controlling intake air of an internal combustion engine, the engine having at least one combustion chamber provided with an intake valve together with an intake manifold provided with a throttle valve, wherein the opening and closure timings of the intake valve are adjustable independently from a crankshaft position to control the amount of intake air supplied to the combustion chamber, the system comprising:

a control for damping an operating signal for the intake valve relative to a change in acceleration or deceleration demand on the engine, for unthrottled intake air control.

6. (Previously Presented) A system for controlling intake air of an internal combustion engine, the engine having at least one combustion chamber, the system comprising:

at least one intake valve provided for the combustion chamber;

an electromagnetic driver operatively connected to each intake valve for opening said intake valve;

an intake manifold with a throttle valve communicating with each intake valve; and

sensors providing operation variables indicative of operator torque request command and engine speed;

a control unit receiving said operation variables to determine a first operation parameter indicative of target intake air based on said operator torque request command and said engine speed,

said control unit being operative to make a selection based on said first operation parameter indicative of target intake air between a first operation range for unthrottled intake air control and a second operation range for throttled intake air control, said first and second operation range being separated from each other by a threshold value of target intake air at

each of varying values of engine speed, said threshold value increases as engine speed increases,

said control unit being operative to vary, with valve opening timing held in the neighborhood of the top dead center, valve closure timing of said intake valve with said throttle valve held in the neighborhood of the wide open throttle position to perform unthrottled intake air control upon selection of said first operation range, and vary throttle valve position of said throttle valve with valve timing of said intake valve held to provide a valve opening duration in the neighborhood of the minimum valve opening duration that is variable with varying engine speed,

said control unit being operative to determine a second operation parameter indicative of a target valve closure timing of said intake valve based on said target intake air,

said control unit being operative to provide a response adjustment to said second operation parameter indicative of said target closure timing to give a processed second operation parameter, and

said control unit being operative to control said electromagnetic driver to cause said intake valve to close at valve closure timing indicated by said processed second operation parameter.

7. (Previously Presented) A method for controlling of intake air of an internal combustion engine, the engine having at least one combustion chamber provided with an intake valve together with an intake line having variable flow area dimensions, outside of the intake valve, determined by a throttle, wherein the opening and closure timings of the intake valve are adjustable independently from a crankshaft position to control the amount of intake air supplied to the combustion chamber, the method comprising:

determining a first operation variable indicative of target intake air;

determining a second operation variable indicative of a preliminary valve closure timing for unthrottled intake air control based on the first operation variable;

processing the second operation variable to provide a response adjustment to give a processed second operation variable;

varying the valve closure timing of the intake valve to close the intake valve at a valve closure timing indicated by the processed second operation variable,

wherein the intake valve is closed in a dampened fashion in response to a change in acceleration or deceleration demand on the engine.

8. (Previously Presented) A computer readable storage medium having stored therein data representing instructions executable by a computer to implement unthrottled control of intake air of an internal combustion engine, the engine having at least one combustion chamber provided with an intake valve, wherein the opening and closing times of the intake valve are adjustable independently from a crankshaft position to control the amount of intake air supplied to the combustion chamber, the computer readable storage medium comprising:

instructions for determining a first operation variable indicative of target intake air;

instructions for determining a second operation variable indicative of a preliminary valve closure timing for unthrottled intake air control based on the first operation variable;

instructions for processing the second operation variable to provide a response adjustment to give a processed second operation variable;

instructions for varying the valve closure timing of the intake valve to close the intake valve at a valve closure timing indicated by the processed second operation variable,

wherein the intake valve is closed in a dampened fashion in response to a change in acceleration or deceleration demand on the engine.

9. (Previously Presented) The method according to claim 1, wherein the operating signal is for timing the opening and closing of the intake valve.

10. (Previously Presented) The method according to claim 1, wherein the operating signal is for regulating the air intake into the combustion chamber.